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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Attorney Dkt TNL A-1403

Ulrich VOLLATH

Group Art Unit: 3661

Serial No.: 10/696,528

Examiner:


Filed: October 28, 2003

For: Ambiguity estimation of GNSS signals for three or more carriers

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 28, 2004.

June 28, 2004

  
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Bruce D. Riter, Reg. No. 27,379

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DISCLOSURE STATEMENT  
UNDER 37 CFR §§1.56, 1.97 & 1.98

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is a five-page Information Disclosure Statement by Applicant, as a substitute for form PTO-1449, with copies of the documents listed therein.

Attention is directed in particular to the document by U. Vollath entitled "Decentralized Floating Solution in Trimble Total Control 2.7, Trimble Terrasat GmbH Internal Report, Issue 1, Revision 1, unpublished (seven pages). Though the document is unpublished, it describes a dual-frequency floating solution implementation in Trimble Total Control 2.7 (TTC 2.7) as released in January 2002, and should be considered as prior art with respect to this patent application.

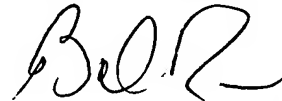
This Disclosure Statement is believed to be submitted before the mailing date of a first Office action on the merits. Pursuant to 37 CFR §1.97(b), Applicant respectfully requests that the enclosed documents be considered.

Applicant further requests that the enclosed document be made of record for printing on any patent which may issue from this application, that the enclosed substitute for Form PTO-1449 be initialed to indicate that the document has been considered, and that a copy of the initialed substitute for Form PTO-1449 be returned to the undersigned.

If this Disclosure Statement is not submitted prior to the mailing date of a first Office action on the merits, Applicants respectfully request that the enclosed document be considered under 37 CFR §1.97(c) and that the undersigned be notified of any fee due.

June 28, 2004

Respectfully Submitted,



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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	10/696,528
		Filing Date	28 October 2003
		First Named Inventor	Ulrich VOLLATH
		Art Unit	2655
		Examiner Name	
Sheet 2	of 5	Attorney Docket Number	A-1403

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		G. Bierman, Factorization Methods for Discrete Sequential Estimation, Academic Press, 1977 (pages 1-241)	
		N. Carlson, Federated Square Root Filter for Decentralized Parallel Processing, IEEE Transactions on Aerospace and Electronic Systems, Vol.AES-26, No.3, May 1990, pp. 517-525	
		S. Cliatt, GPS Modernization, Proceedings of the GNSS 2003, April 22-25 2003, Graz Austria (15 pages)	
		K. de Jong, Integrated GPS/Galileo ambiguity resolution, Proceedings of NaviTec 2001, 1st ESA workshop on satellite navigation user equipment technologies, December 2001, pp. 318-325 (8 pages)	
		K. de Jong, Future GPS and Galileo signals, Geo-Informatics, September 2002, 2 pp.	
		P. de Jonge, The LAMBDA method for integer ambiguity estimation: implementation aspects, LGR-Series No. 12, Delft Geodetic Computing Center, Delft University of Technology, The Netherlands, August 1996, 49 pp.	
		P. de Jonge, Computational aspects of the LAMBDA method for GPS ambiguity resolution, Proceedings ION GPS-96, 9th International Technical Meeting of the Satellite Division of the Institute of Navigation, Kansas City, Missouri, Sept. 17-20, pp. 935-944	
		H.-J. Euler et al., Fast GPS ambiguity resolution on-the-fly for real-time applications, Proceedings of Sixth International Geodetic Symposium on Satellite Positioning, Columbus, OH, March 17-20, pp. 650-659	
		A. Gelb (ed.), Applied Optimal Estimation, The M.I.T. Press, 1992. pp. 107-113 and pp. 133-136	
		E. Grafarend et al., Generating Classes of Equivalent Linear Models by Nuisance Parameter Elimination- Applications to GPS Observations, Manuscripta Geodetica 11 (1986), pp. 262-271	

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		M. Grewal et al., Kalman filtering: theory and practice using MATLAB, second edition, 2001, John Wiley & Sons, New York (401 pages)	
		R. Hatch, The synergism of GPS code and carrier phase ambiguities, Proceedings of the 3rd International Geodetic Symposium on Satellite Doppler Positioning, Las Cruces, New Mexico, February 1982, Vol. 2, pp 1213-1232	
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		R. Hatch, Comparison of several AROF kinematic techniques, Proceedings of ION GPS-94, Salt Lake City, UT, September 20-23, pp. 363-370	
		R. Hatch, The Promise of a Third Frequency, GPS World, May 1996, pp. 55-58	
		R. Hatch, GPS Carrier-Phase Ambiguity Resolution, Institute for Mathematics and its Applications (IMA) "HOT TOPICS" Workshop: Mathematical Challenges in Global Positioning Systems (GPS), August 16-18, 2000, 57 pp.	
		G. Hein et al., Galileo Frequency & Signal Design, GPS World, June 2003, pp. 30-37.	
		B. Hofmann-Wellenhof et al., GPS Theory and Practice, Springer-Verlag, Fifth Edition, 2001, pp. 213-248	
		P. Joosten et al., GNSS Three Carrier Phase Ambiguity Resolution using the LAMBDA-method, Proceedings of the GNSS 1999 (6 pages)	

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		H. Landau et al., On-the-fly ambiguity resolution for precise differential positioning, Proceedings of ION GPS-92, Albuquerque, NM, September 16-18, pp. 607-613	
		A. Leick, GPS Satellite Surveying, Second Edition, John Wiley & Sons, Inc., 1995 (560 pages)	
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		P. Teunissen, The least-squares ambiguity decorrelation adjustment: a method for fast GPS integer ambiguity estimation, Journal of Geodesy, 1-2, 1995, pp. 65-82	
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		P.G. Teunissen et al., Ambiguity dilution of precision: Definition, Properties and Application, Proceedings of the ION GPS-97, 16-19 September 1997, Kansas City, USA, pp. 891-899	
		P. Teunissen, The GPS integer least-squares statistics, Phys. Chem. Earth, 25(A9-A11), 673-677	
		P. Teunissen, Statistical GNSS Carrier Phase Ambiguity Resolution: A Review, IEEE Workshop on Statistical Signal Processing Proceedings 2001 (9 pages)	

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		P. Teunissen, The success rate and precision of GPS ambiguities, J. Geod., 74(3/4), 2000, pp. 321-326	
		U. Vollath et al., Analysis of Three-Carrier Ambiguity Resolution (TCAR) Technique for Precise Relative Positioning in GNSS-2, Proceedings of the ION-GPS 1998, Nashville, September 15-18, The Institute of Navigation, Alexandria, VA, pp. 417-426	
		U. Vollath et al., Ambiguity Resolution using Three Carriers, Performance Analysis using "Real" Data, Proceedings of the GNSS-2001 conference, Seville, May 2001, __ pp.	
		U. Vollath et al., Network RTK Versus Single Base RTK - Understanding the Error Characteristics, Proceedings of the GNSS-2002 Conference, May 2002, pp. 2774-2780	
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		J. Wang et al., A discrimination test procedure for ambiguity resolution on-the-fly, Journal of Geodesy (1998) 72, pp. 644-653	
		"Trimble Total Control Software" Technical Notes, Product Brochure of Trimble Navigation Limited, 05/02 (8 pages)	

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